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LASER REPAIR AND LONG TERM TECHNICAL SUPPORT(U) BLOCK
ENGINEERING INC CAMBRIDGE MA 22 OCT 82 BE-82-963
DAAK20-79-C-0026

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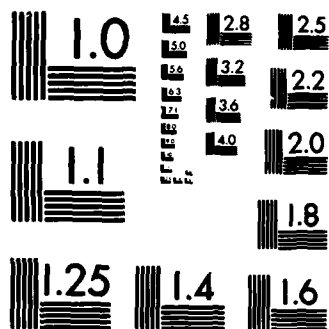
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FINAL REPORT
LASER REPAIR AND LONG TERM
TECHNICAL SUPPORT

OCTOBER 22, 1982

Submitted to:

USAERADCOM
Ft. Monmouth, NJ 07703

In Response to:

DAAK20-79-C-0026

Submitted by:

BLOCK ENGINEERING
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BLOCK
ENGINEERING

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1.0 OBJECTIVE

1.1 BACKGROUND

Block Engineering designed, fabricated, and tested a system for measuring atmospheric transmission at three laser wavelengths under a prior contract (DAAB07-77-C-0907) jointly to ECOM and the Republic of Korea. After acceptance in December 1978 by the Army, the system was shipped to the Agency for Defense Development for installation at the Korean field site. In the spring of 1979, ADD advised the Army that two of the lasers (CO₂ and Nd:YAG) were no longer working, and that they were having some problem trying to get the transmissometer operational at their field test sight.

1.2 Present Effort

In an effort to support the needs of the Korean Government, the Army directed Block Engineering to:

- a) Repair or replace the two lasers, verify their operation and return them to Korea;
- b) Send an engineer to Korea to make some minor modifications to the system and to provide additional, on-site training to ADD personnel;
- c) Provide subsequent consulting support, by mail or telephone as appropriate following the field effort; and
- d) Provide a brief final report. (This report.)

As it happened, the repaired lasers were broken again before the on-site support could be supplied. The Army modified Block's directions to provide for a second round of laser repairs in lieu of the engineer's field support. The consulting support was to be slightly curtailed.

2.0 ACTIVITIES

2.1 FIRST LASER REPAIRS

The two lasers were received at Block in August 1979.

The YAG laser was found to be operational when received at Block. The exit mirror required a slight realignment, and the incandescent lamp was replaced because its output was slightly low. Block was unable to determine, however, why the Koreans believed the YAG laser was not functioning.

The CO₂ laser tube was fractured. The tube was replaced by the manufacturer. The cause of the damage could not be established. Other than the obvious possibilities of accidental damage in Korea or in shipment back to Block from Korea*, the manufacturer noted that excessive cooling water pressure would have given rise to similar damage. This seems an unlikely explanation since a pressure regulator is incorporated in the transmissometer.

Operation of the laser was verified by the Government at Block prior to shipping the repaired lasers to Korea in early December of 1978.

*Damage in shipment to Korea was ruled out because ADD personnel verified that the lasers were working on arrival.

2.2 Preparation for Field Trip

Following completion of the laser repair Block began to make arrangements and preparations to send two members of the engineering staff to Korea. ADD personnel were scheduled to visit the U.S. They intended to visit Block and to discuss their needs and desires more extensively than was possible by phone or mail. This trip was originally to have occurred in time to witness the testing of the repaired lasers. However Korea was experiencing internal political difficulties in late 1979 and their trip had to be postponed. (It finally occurred in September of 1980). At the same time, the requests for Area Clearance and Certificate of Credibility which Block required to make its trip to Korea were being processed. It became clear that Block's trip could not be made until the summer of 1980.

Before the trip could be made and during Blocks attempt to check on system status ADD reported in July that the lasers were, again, broken. Block postponed it trip until the lasers were repaired again.

2.3 Second Laser Repair

The lasers were received at Block for the second time in mid November 1980. They had been extensively damaged in shipment because of improper packaging and also possibly due to shipment mishandling. This was documented in a separate memo to the Technical Monitor Deputy.

The CO₂ laser tube was once again found to be shattered.

The Nd:YAG crystal was broken. Only a short mounting stub was still in the cavity; the bulk of the rod was broken off, and was, in fact, never found.

The CO₂ laser power supply was heavily damaged - panel mounted parts were sheared off, and a transformer and filter capacitor were no longer attached to the chassis. The cooler/heat exchanger for the YAG laser was damaged beyond repair.

Block sent the units back to their respective manufactures for evaluation. Since these repairs were outside the scope of our contract, Block requested directions from the Army. The funds remaining in the contract (primarily for the field service trip) could be redirected to the laser repairs, or else new monies could be supplied. The lasers had to be repaired unless the transmissiometer was to be abandoned.

The Army indicated agreement that the lasers would have to be repaired out of the existing contract funds. In order to expedite the project, Block authorized the repairs of the lasers at its own risk while waiting for the contract modification.

The repaired lasers were received at Block and checked out by mid summer of 1981. They were packed for overseas shipment in September 1981, accompanied by some additional spare parts and modification kits requested by ADD.

The contract modification authorizing the laser repairs was finally received at Block in August 1982. Shipping was authorized in mid September, and took place on the 20th.

3.0 RESULTS

The lasers were picked up in Korea on 28 September 1982. Block has received no further communication from ADD and therefore concludes that the lasers are working and that the transmissometer system operation is satisfactory. Block will consider the contract completed successfully on October 28, 1982 after the one month consulting availability is concluded.

END

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